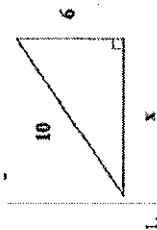


ALGEBRA 2 PRACTICE FINAL

Multiple Choice

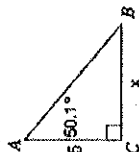
Identify the letter of the choice that best completes the statement or answers the question.

Find the missing side length using the Pythagorean Theorem.



1. a. 8 b. 64 c. 11.66 d. 10.25

2. Find x



3. a. 3.83 b. 5.98 c. 4.18 d. 5

4. Find the axis of symmetry of $y = x^2 - 6x + 3$

- a. $y = 3$ b. $x = 3$ c. $x = -3$ d. $y = -3$

Rewrite the radian measure in degrees.

4. $\frac{2\pi}{6}$

- a. 15° b. 60° c. 600° d. 60°

Simplify the following expressions.

5. $(4+i)(2-3i)$
a. $11-10i$ b. $5-10i$ c. $6-2i$ d. $8-2i$

6. $\sqrt{-289}$
a. -17 b. $17i$ c. $-17i$ d. 17

Write a quadratic equation with the given roots. Write the equation in the form $ax^2 + bx + c = 0$, where a , b , and c are integers.

7. -10 and -2
a. $x^2 - 8x - 20 = 0$ c. $x^2 + 12x + 20 = 0$
b. $x^2 + 8x - 20 = 0$ d. $x^2 - 12x - 20 = 0$

Find the coordinates of the vertex of the quadratic function.

8. $f(x) = 2(x-5)^2 + 3$
a. $(5, 3)$ c. $(-5, 3)$
b. $(2, 3)$ d. $(5, -3)$

Solve the equation by factoring.

9. $x^2 + 8x - 48 = 0$
a. $x = -4, -12$ c. $x = -12, 4$
b. $x = 4, 12$ d. $x = -4, 12$

10. Merlin Industries bought a laptop for \$2100. It is expected to depreciate at a rate of 14% per year. What will the value of the laptop be in 5 years?

- a. \$912 c. \$1806
b. \$988 d. \$4043

11. TalJohn and Mary have scores of $9-6i$ and $3+4i$, respectively. What is the sum of their scores?

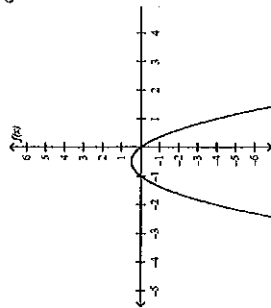
- a. $12-2i$ b. $51+18i$ c. $12-10i$ d. $10i$

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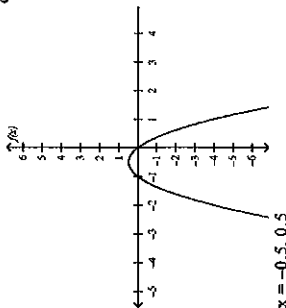
Solve the equation by graphing.

12. $-2x^2 - 2x = 0$

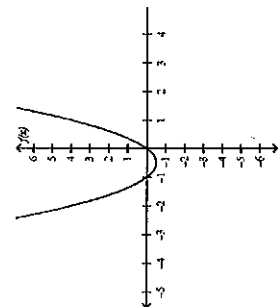
a.



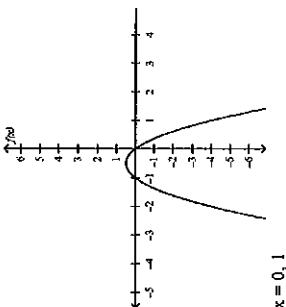
b. $x = -1, 0$



$x = -0.5, 0.5$



$x = 0, 1$



$x = 0, 1$

ID: A

13. Consider the quadratic function $f(x) = -2x^2 + 5x + 2$. Find the y-intercept and the equation of the axis of symmetry.

a. The y-intercept is -2 .

The equation of axis of symmetry is $x = -\frac{5}{4}$.

b. The y-intercept is $+2$.

The equation of axis of symmetry is $x = \frac{5}{4}$.

c. The y-intercept is $\frac{5}{4}$.

The equation of axis of symmetry is $x = +2$.

d. The y-intercept is $-\frac{5}{4}$.

The equation of axis of symmetry is $x = -2$.

14. What is the period of the equation $y = 2\sin 3x$

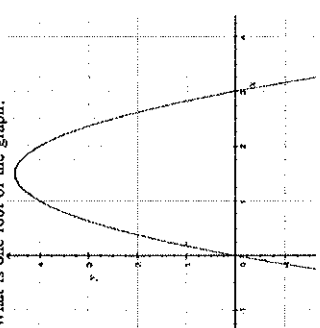
a. 3

b. 2

c. π

d. $\frac{2\pi}{3}$

15. What is one root of the graph?



a. 1.5

b. 3

c. 4

d. 4.5

16. Find the equation of the quadratic function that goes through the points $(-2, 3)$ and $(0, -1)$.

a. $y = \frac{1}{4}(x-2)^2 - 3$

c. $y = -(x-2)^2 + 3$

b. $y = (x+2)^2 + 3$

d. $y = -(x+2)^2 + 3$

ID: A

Find x.

17. $2^{4x-1} = 16$

a. $x = 4$

b. $x = \frac{3}{4}$

c. $x = 1$

d. $x = \frac{5}{4}$

18. $7^{2x+1} = 7^{2x+3}$

a. $x = \frac{2}{3}$

b. $x = 2$

c. $x = -2$

d. $x = -\frac{3}{2}$

19. Write the equation of the new function obtained by shifting $y = x^2$ down 5 units.

a. $y = 5x^2$

b. $y = x^2 - 5$

c. $y = x^2 + 5$

d. $y = (x-5)^2$

20. Which function represents exponential decay?

a. $y = -4 \cdot 3^x$

b. $y = 4(-3)^x$

c. $y = 0.4(3)^x$

d. $y = 4(0.3)^x$

Find the exact solution of the following quadratic equation by using the Quadratic Formula.

21. $-x^2 + 7x + 11 = 0$

a. $\left\{ \frac{-7 - \sqrt{56}}{-2}, \frac{-7 + \sqrt{56}}{-2} \right\}$

c. $\left\{ \frac{-7 - \sqrt{93}}{-2}, \frac{-7 + \sqrt{93}}{-2} \right\}$

b. $\left\{ \frac{-7 - \sqrt{5}}{-2}, \frac{-7 + \sqrt{5}}{-2} \right\}$

d. $\left\{ \frac{7 - \sqrt{93}}{-2}, \frac{7 + \sqrt{93}}{-2} \right\}$

22. What is the amplitude of the function $y = -5 \cos 2x$?

a. -5

b. 5

c. 2

d. π

Choose the transformation of the parent function that is NOT true according to the equation.

23. $y = -\frac{1}{2}x^2 + 4$

a. Opens down

b. Wider

c. Shifted up 4 units

d. Shifted right 4 units

24. $y = 6(x+1)^2 - 2$

a. Skinnier parabola

b. Shifted down 2 units

c. Shifted left 1 unit

d. Shifted right 1 unit

ID: A

25. What is the common factor of $x^2 - 2x - 8$ and $x^2 - 5x + 4$?

a. x^2

b. $x + 4$

c. 4

d. $x - 4$

26. What is the value of x if $\sqrt{8-3x} = 2i$?

a. 3.33

b. 1

c. 4

d. 0

27. A 30-ft long ladder rests against a wall at an angle of 52° with the ground. How far is the foot of the ladder from the wall? Draw a picture to help you.

a. 18.47 ft

c. 23.64 ft

b. 63.9 ft

d. 30 ft

28. 9^{-1}

a. 9

b. 1

c. $\frac{1}{9}$

d. 0

Rewrite the degree measure in radians.

29. 9°

a. $\frac{20}{\pi}$

c. $\frac{\pi}{20}$

b. 3600π

d. 1146.5π

30. Find the new equation $g(x)$ obtained by taking $f(x) = 4(x-7)^2 + 3$ and shifting it left 5 units and down 6 units.

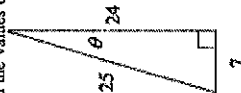
a. $f(x) = 4(x-12)^2 + 3$

c. $f(x) = 4(x-1)^2 - 2$

b. $f(x) = 4(x-12)^2 - 3$

d. $f(x) = 4(x-2)^2 - 3$

31. Find the values of the six trigonometric functions for angle θ .



- a. $\sin \theta = \frac{7}{25}$ $\cos \theta = \frac{24}{25}$ $\tan \theta = \frac{7}{24}$
 $\csc \theta = \frac{25}{7}$ $\sec \theta = \frac{25}{24}$ $\cot \theta = \frac{24}{7}$
- b. $\sin \theta = \frac{24}{25}$ $\cos \theta = \frac{7}{25}$ $\tan \theta = \frac{24}{7}$
 $\csc \theta = \frac{25}{24}$ $\sec \theta = \frac{25}{7}$ $\cot \theta = \frac{7}{24}$
- c. $\sin \theta = \frac{7}{25}$ $\cos \theta = \frac{24}{25}$ $\tan \theta = \frac{7}{24}$
 $\csc \theta = \frac{25}{7}$ $\sec \theta = \frac{25}{24}$ $\cot \theta = \frac{24}{7}$

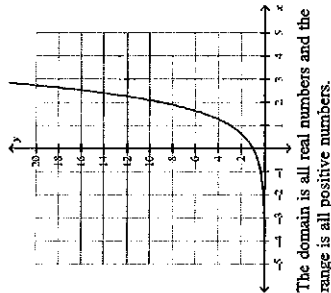
32. If $2x$ is one factor of $2x^2 - 16x$, what is the other factor?

- a. $x - 16$ b. $x + 8$ c. $x - 8$ d. $x^2 - 14x$

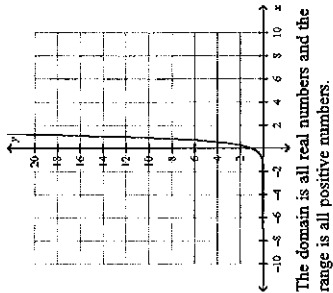
- Sketch the graph of the given function. Then state the function's domain and range.

33. $y = 4(3)^x$

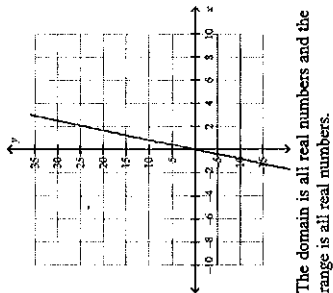
a.



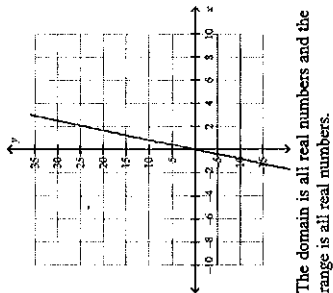
b.



c.



d.



Write the exponential function that fits the given information.

34. You have \$900 in a bank account and you spend 10% of the money every month.

a. $y = 900(0.1)^x$ b. $y = 900(-10)^x$ c. $y = 900(0.9)^x$ d. $y = 900(1.1)^x$

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35.

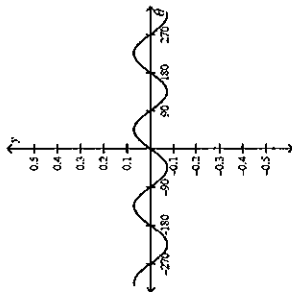
x	y
-1	0.833
0	5
1	30

- a. $y = 5(3)^x$ b. $y = 5(30)^x$ c. $y = 6(5)^x$ d. $y = 5(6)^x$

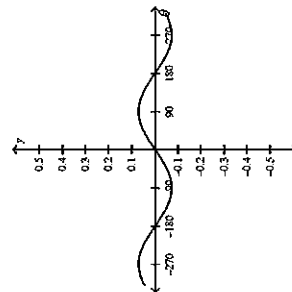
Find the amplitude, if it exists, and period of the function. Then, graph the function.

36. $y = \frac{1}{14} \sin \theta$

a.



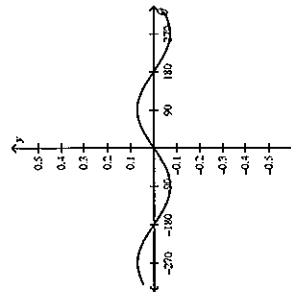
c.



amplitude: $\frac{1}{14}$; period: π

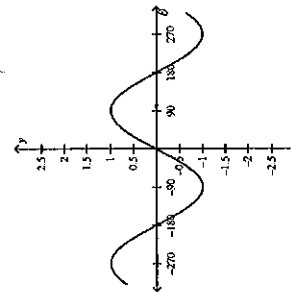
amplitude: $\frac{1}{14}$; period: 2π

b.



amplitude: does not exist; period: π

d.



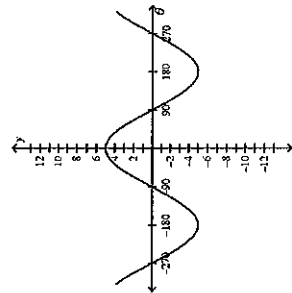
amplitude: $\frac{1}{14}$; period: 2π

9

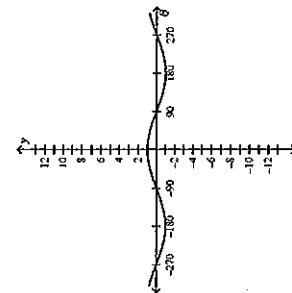
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37. $y = 5 \cos \theta$

a.



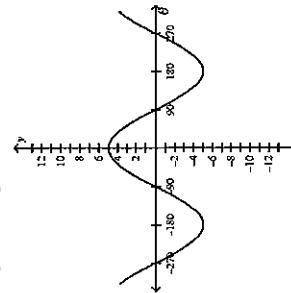
c.



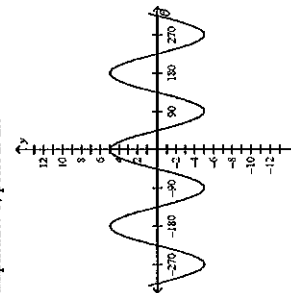
amplitude: 5; period: 2π

amplitude: 1; period: 2π

b.



d.



amplitude: does not exist; period: π

amplitude: 5; period: π

38. Write the equation of the exponential function through the points $(0, -2)$ and $(1, -8)$.

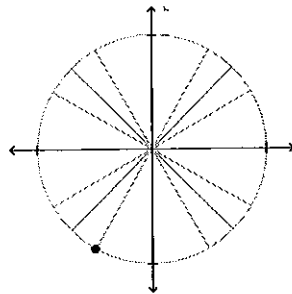
- a. $y = -4(2)^x$ b. $y = -2(4)^x$ c. $y = -2(2)^x$ d. $y = -2(8)^x$

39. Find the value of $h(7)$ if $h(x) = x^2$

- a. $7x^2$ b. -49 c. 49 d. -7

10

Label the point on the unit circle in radians and degrees.



40. a. $135^\circ, \frac{5\pi}{4}$ b. $135^\circ, \frac{5\pi}{6}$ c. $150^\circ, \frac{5\pi}{4}$ d. $150^\circ, \frac{5\pi}{6}$

41. Which function is increasing the fastest?

- a. $y = 8 \cdot 4^x$ b. $y = 3 \cdot \frac{1}{4}^x$ c. $y = 12(0.5)^x$ d. $y = 3 \cdot 7^x$

42. At the beginning of the census, an island has a population of 10,000 rabbits. Three years later there are 40,000 rabbits on the island. Write an equation to model the growth of the rabbit population.

- a. $y = 10,000(1.387)^x$ b. $y = 4x^3$ c. $y = 10,000(4)^x$ d. $y = 40,000 = 4(x - 10,000)$

Determine whether the given function has a maximum or a minimum value. Then, find the maximum or minimum value of the function.

43. $f(x) = 2x^2 - 6x + 6$
 a. The function has a minimum value. The minimum value of the function is 19.5.
 b. The function has a maximum value. The maximum value of the function is 1.5.
 c. The function has a minimum value. The minimum value of the function is 1.5.
 d. The function has a maximum value. The maximum value of the function is 19.5.

44. The Smiths bought a house for \$112,000. Assuming that the value of the apartment will depreciate (decrease) by 4% a year, how much will the apartment be worth in 3 years?

- a. \$125,984.77 b. \$75,916 c. \$99,090.43 d. \$4,480

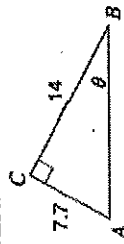
45. In a tourist bus near the base of Eiffel Tower at Paris, a passenger estimates the angle of elevation to the top of the tower to be 60° . If the height of Eiffel Tower is about 984 feet, what is the distance from the bus to the base of the tower? (Draw a picture to help).

- a. 492 feet c. 586.13 feet
 b. 568.13 feet d. 1704.28 feet

Find the solutions of the quadratic function using the method of your choice.

46. $y = x^2 + 8x + 15$
 a. $x = 5, 3$ b. $x = 15, 1$ c. $x = -5, -3$ d. $x = -15, -1$

47. Find θ .



- a. 61.2° b. 33.4° c. 1.9° d. 28.8°